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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/634,528	08/05/2003	Constantin C. Stancu	GP-302601	6058
7590	12/29/2004		EXAMINER	
CHRISTOPHER DEVRIES General Motors Corporation Legal Staff, Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000				MILLER, PATRICK L
				ART UNIT
				PAPER NUMBER
				2837
DATE MAILED: 12/29/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/634,528	STANCU ET AL.
	Examiner Patrick Miller	Art Unit 2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
 5) Claim(s) ____ is/are allowed.
 6) Claim(s) 1-3,9-12 and 18 is/are rejected.
 7) Claim(s) 4-8 and 13-17 is/are objected to.
 8) Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 05 August 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 08052003.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.
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DETAILED ACTION

Claim Objections

1. Claims 1-9 and 11-18 are objected to because of the following informalities: see bullet(s) below. Appropriate correction is required.

- Claim 1 recites, “a three-phase voltage source inverter” (l. 12). Change “a” to “the” or “said.”
- Claim 2 recites, “a corresponding motor phase current signal” (ll. 7-8, 11-12). Change “a” to “the.”
- Claim 2 recites, “a harmonic decoupling block” (l. 9). Change “a” to “the.”
- In Claim 2, insert “the” between “generate” and “corrected” on line 12.
- Claim 2 recites, “a phase current of the...” (l. 14). Change “a” to “the.”
- Claim 4 recites, “a sinusoid” (l. 14). Distinguish this from the first sinusoid by inserting “second” before sinusoid.
- Claim 4 recites, “a subtractor block” (ll. 16-17). It is unclear whether this block is included in the subtractor blocks recited in claim 1. Please clarify.
- Claim 4 recites, “a corresponding said motor phase current signal” (l. 19). Change “a” to “the.”
- Claim 5 recites, “a corresponding said motor phase current signal” (l. 4). Change “a” to “the.”
- In Claim 8, please distinguish the two sinusoids by labeling them “said first sinusoid” (ll. 1-2) and “said second sinusoid” (l. 2).

- Claim 11 recites, “a corresponding motor phase current” (ll. 2, 7, 10). Change “a” to “the.”
- In Claim 11, insert “the” between “generate” and “corrected” on line 11.
- Claim 13 recites, “a sinusoid” (l. 11). Distinguish this from the first sinusoid by inserting “second” before sinusoid.
- Claim 13 recites, “a corresponding said motor phase current signal” (ll. 16-17). Change “a” to “the.”
- Claim 14 recites, “a corresponding said motor phase current signal” (ll. 4-5). Change “a” to “the.”
- In Claim 17, please distinguish the two sinusoids by labeling them “said first sinusoid” (ll. 1-2) and “said second sinusoid” (l. 2).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 9-12, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Khambadkone et al (“Compensated Synchronous PI Current Controller in Overmodulation Range and Six-Step Operation of Space-Vector-Modulation-Based Vector-Controlled Drives”).

- With respect to claims 1 and 10, Khambadkone et al disclose a drive system and method comprising: a feedback path including a harmonic decoupling block that subtracts

selected harmonic components from signals representative of a corresponding motor phase current to generate corrected feedback signals (Fig. 9, “upper” feedback loop; harmonic current is estimated by the harmonic voltage, thus the voltage is representative of phase current); a subtractor blocks that subtracts corrected feedback signals from signals representative of open-loop magnetizing reference currents to generate difference signals (Fig. 9, error signal $e_{\text{sub.zh}}$ output from the subtractor); and a modulation block that uses the difference signals to produce drive signals for a three-phase voltage source inverter in an overmodulated six-step mode (Fig. 9, SVM; see also Section IV, Part A and Section V).

- With respect to claims 2 and 11, Khambadkone et al disclose a coordinate block that transforms the feedback current from the stationary reference frame to the rotor field reference frame (Fig. 9, multiplied by $e^{-j\delta}$), and with respect to claims 2, 3, 9, 11, 12, and 18, the harmonic decoupling block eliminates harmonics of at least $6n$, where n is an integer greater than or equal to zero (Section III 5th, 7th, 11th, and 13th, harmonics and $\mp 6nf$).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3, 9-12, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiti et al (6,163,128) in view of Ho (6,777,907).

- With respect to claims 1 and 10, Hiti et al disclose a drive system and method comprising: a subtractor blocks that subtracts corrected feedback signals from signals representative of open-loop magnetizing reference currents to generate difference signals (Fig. 1, #s 22 subtract id and iq from open-loop currents); and a modulation block that uses the difference signals to produce drive signals for a three-phase voltage source inverter in an overmodulated six-step mode (Fig. 1, #25; cols. ½, ll. 12-17/12-17, where operation above a base speed is interpreted to be overmodulated).
- Hiti et al do not disclose a harmonic decoupling block in the feedback path.
- Ho discloses a harmonic decoupling block in the feedback path, where the harmonic decoupling block eliminates selected harmonic components from signals representative of a corresponding motor phase current (Fig. 1, #5, Fig. 2; col. 2, ll. 7-31). The motivation to implement a harmonic decoupling block is to eliminate harmonic torques due to inverter blanking time (col. 1, ll. 23-35).
- Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to implement the harmonic decoupling block of Ho, into the current

feedback path of the Hiti et al system, thereby providing the advantage of eliminating harmonic torques, as taught by Ho.

- With respect to claims 2 and 11, Hiti et al disclose a coordinate block that transforms the feedback current from the stationary reference frame to the rotor field reference frame (Fig. 1, #26), and Ho discloses the harmonic decoupling block eliminates harmonics of at least $6n$, where n is an integer greater than or equal to zero (col. 1, ll. 34-35; col. 3, ll. 22-25).
- With respect to claims 3, 9, 12, and 18, Ho discloses the harmonic decoupling block eliminates any harmonic torque, including the sixth and twelfth harmonic torques, respectively (col. 3, ll. 22-25).

Allowable Subject Matter

4. Claims 4-8 and 13-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- With respect to claims 4 and 13, the Prior Art does not disclose a drive system and method that multiplies and filters the signals as described in the claims by the system and method, respectively.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Miller whose telephone number is 571-272-2070. The examiner can normally be reached on M-F, 8:30-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on 571-272-2800 ext 41. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9318. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-3431. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Miller
Patrick Miller
Examiner
Art Unit 2837

pm
December 23, 2004


RINA DUDA
PRIMARY EXAMINER